CLAIMS

1\. A method for creating and maintaining a plurality of virtual servers within a server, the method comprising the steps of:

 partitioning resources of the server to establish an instance of each virtual server; and

 enabling controlled access to the resources using logical boundary checks and security interpretations of those resources within the server.

2\. The method of Claim 1 wherein the step of partitioning comprises the steps of:

 allocating dedicated resources of the server to each instance of the virtual server; and

 sharing common resources of the server among all of the virtual servers.

3\. The method of Claim 2 wherein the dedicated resources are units of storage and network addresses of network interfaces of the server.

4\. The method of Claim 3 wherein the common resources are an operating system and a file system of the server.

5\. The method of Claim 4 wherein the server is a filer and wherein the virtual servers are virtual filers (vfilers).

6\. The method of Claim 5 wherein the step of enabling comprises the step of providing a vfiler context structure including information pertaining to a security domain of the vfiler.

7\. The method of Claim 6 wherein the step of allocating comprises the step of providing a vfstore list of the vfiler context structure, the vstore list comprising pointers to vfstore

3 soft objects, each having a pointer that references a path to a unit of storage allocated to

4 the vfiler.

1 8. The method of Claim 7 wherein the step of allocating further comprises the step of

2 providing a vfnet list of the vfiler context structure, the vfnet list comprising pointers to

3 vfnet soft objects, each having a pointer that references an interface address data structure

4 representing a network address assigned to the vfiler.

1 9. The method of Claim 8 wherein the step of enabling further comprises the step of per-

2 forming a vfiler boundary check to verify that a vfiler is allowed to access certain storage

3 resources of the filer.

1 10. The method of Claim 9 wherein the step of performing comprises the step of validat-

2 ing a file system identifier and qtree identifier associated with the units of storage.

1 11. The method of Claim 10 wherein the step of performing further comprises the steps

2 of:

3   for each request to access a unit of storage, using the identifiers to determine

4 whether the vfiler is authorized to access the unit of storage;

5   if the vfiler is not authorized to access the requested unit of storage, immediately

6 denying the request;

7   otherwise, allowing the request; and

8   generating file system operations to process the request.

1 12. A system adapted to create and maintain a plurality of virtual servers within a server,

2 the system comprising:

3   storage media configured to store information as units of storage resources, the

4 units of storage resources allocated among each of the virtual servers;

5   network interfaces assigned one or more network address resources, the network

6 address resources allocated among each of the virtual servers;

7   an operating system having a file system resource adapted to perform a boundary

8   check to verify that a request is allowed to access to certain units of storage resources on

9   the storage media, each virtual server allowed shared access to the file system; and

10   a processing element coupled to the network interfaces and storage media, and

11   configured to execute the operating and file systems to thereby invoke network and stor-

12   age access operations in accordance with results of the boundary check of the file system.

1   13. The system of Claim 12 further comprising a context data structure provided to each

2   virtual server, the context data structure including information pertaining to a security

3   domain of the virtual server that enforces controlled access to the allocated and shared

4   resources.

1   14. The system of Claim 13 wherein the units of storage resources are volumes and

2   qtrees.

1   15. The system of Claim 14 further comprising a plurality of table data structures ac-

2   cessed by the processing element to implement the boundary check, the table data struc-

3   tures including a first table having a plurality of first entries, each associated with a vir-

4   tual server and accessed by a file system identifier (fsid) functioning as a first key into the

5   table, each first entry of the first table denoting a virtual server that completely owns a

6   volume identified by the fsid.

1   16. The system of Claim 15 wherein the table data structures further include a second ta-

2   ble having a plurality of second entries, each associated with a virtual server and accessed

3   by a second key consisting of an fsid and a qtree identifier (qtreeid), each second entry of

4   the second table denoting a virtual server that completely owns a qtree identified by the

5   fsid and qtreeid.

1   17. The system of Claim 16 wherein the server is a filer and wherein the virtual servers

2   are virtual filers.

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1   18. Apparatus adapted to create and maintain a plurality of virtual filers (vfilers) within

2   a filer, the apparatus comprising:

3   means for allocating dedicated resources of the filer to each vfiler;

4   means for sharing common resources of the filer among all of the vfilers; and

5   means for enabling controlled access to the dedicated and shared resources using

6   logical boundary checks and security interpretations of those resources within the server.

1   19. The apparatus of Claim 18 wherein the means for enabling comprises means for per-

2   forming a vfiler boundary check to verify that a vfiler is allowed to access certain dedi-

3   cated resources of the filer.

1   20. The apparatus of Claim 18 wherein the means for enabling comprises means for pro-

2   viding a vfiler context structure including information pertaining to a security domain of

3   the vfiler.

1   21. A computer readable medium containing executable program instructions for creat-

2   ing and maintaining a plurality of virtual filers (vfilers) within a filer, the executable pro-

3   gram instructions comprising program instructions for:

4   allocating dedicated resources of the filer to each vfiler;

5   sharing common resources of the filer among all of the vfilers; and

6   enforcing access to the dedicated and shared resources using logical boundary

7   checks and security interpretations of those resources within the server.

1   22. The computer readable medium of Claim 21 wherein the program instruction for

2   enabling comprises a program instruction for performing a vfiler boundary check to ver-

3   ify that a vfiler is allowed to access certain dedicated resources of the filer.

1   23. The computer readable medium of Claim 21 wherein the program instruction for

2   enabling comprises a program instruction for providing a vfiler context structure includ-

3   ing information pertaining to a security domain of the vfiler.

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